



## Subject card

Subject name and code	Fundamentals of Modelling Systems, PG_00055497						
Field of study	Mechanical Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group			Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish -		
Semester of study	5	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Machine Design and Vehicles -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Ryszard Woźniak					
	Teachers	dr inż. Ryszard Woźniak					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	30.0	0.0	45
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	45		6.0		49.0	100
Subject objectives	General introduction to the methods of creating, simulating the actions and actual properties with internal combustion engines and propulsion systems of vehicles.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U03] is able to identify, formulate and develop the documentation of a simple design or technological task, including the description of the results of this task in Polish or in a foreign language and to present the results using computer software or other aiding tools	Student describes: methods of creation and system simulation with engines combustion and systems propulsion vehicles. calculates these systems.	[SU1] Assessment of task fulfilment
	[K6_W11] possesses knowledge on design, technology and manufacturing of machine parts, metrology, and quality control; knows and understands methods of measuring and calculating basic values describing the operation of mechanical systems, knows basic calculating methods applied to analyse the results of experiments	Student describes: methods of creation and system simulation with engines combustion and systems propulsion vehicles. calculates these systems.	[SW3] Assessment of knowledge contained in written work and projects
	[K6_U11] is able to analyse the operation of devices and compare the construction solutions applying usage, safety, environmental, economic and legal criteria	Student describes: methods of creation and system simulation hydraulic drives and pneumatic systems propulsion with engines combustion and systems propulsion vehicles. calculates these systems.	[SU1] Assessment of task fulfilment
	[K6_W08] possesses basic knowledge including the methodology of designing machine parts, mechanical devices, selection of construction materials, manufacturing and operation, with the lifetime cycle	Student describes: methods of creation and system simulation with engines combustion and systems propulsion vehicles. calculates these systems.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
Subject contents	<p>LECTURE Construction of a friction clutch in a dry motor vehicle. Criteria of driving torque and friction work, pressures, friction linings, dimensions of the disc spring, clutch control system. Construction of gearboxes. Selection of the distance between the shaft axes, calculations of gears, shafts and bearings. Calculators of synchronizers. Drive shafts of the following types: balanced, partially balanced and unbalanced.</p> <p>PROJECT. Modeling of a friction clutch in a dry motor vehicle: criteria of driving torque and specific friction work, estimation of unit pressures, selection of friction linings, modeling of the dimensions of a disc spring, calculations of the clutch control system. Modeling of gears, shafts and bearings in a gearbox. Modeling of synchronizers. Modeling of drive shafts of the following types: balanced, partially balanced and unbalanced.</p>		
Prerequisites and co-requisites	No requirements		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Projects	75.0%	100.0%
Recommended reading	Basic literature	<p>1. Z. Jaśkiewicz i In.: Poradnik inżyniera samochodowego, elementy i materiały. WKiŁ, Warszawa, 1990.</p> <p>2. Z. Jaśkiewicz: Projektowanie układów napędowych pojazdów samochodowych WKiŁ, Warszawa, 1982.</p> <p>3. K. Studziński.: Samochód. Teoria, konstrukcja i obliczanie. WKiŁ, Warszawa 1980.</p> <p>4. Z Jaśkiewicz, A Wąsiewski.: Układy napędowe samochodów. Przekładnie walcowe. Tom I. WKiŁ, Warszawa 1992.</p> <p>5. Z Jaśkiewicz, A Wąsiewski.: Układy napędowe samochodów. Przekładnie walcowe. Tom I. WKiŁ, Warszawa 1995.</p>	
	Supplementary literature	No requirements	

	eResources addresses	Adresy na platformie eNauczenie: Podstawy modelowania układów napędowych - W-15/Ć-0/L-30/P-0, WIMiO, PMRiUN, I st., sem. 05, stacjonarne, (M:31575W0), semestr zimowy 2023/2024 - Moodle ID: 31251 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=31251">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=31251</a>
Example issues/ example questions/ tasks being completed	-	
Work placement	Not applicable	

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